REMARKS

This paper is being provided in response to the Final Office Action dated August 4, 2004, for the above-referenced application. In this response, Applicant has cancelled claims 8-11 without prejudice or disclaimer of the subject matter thereof, amended claim 1 and added new claims 12 and 13 to clarify that which Applicant considers to be the invention. Applicant respectfully submits that the amendments to the claims and the new claims are fully supported by the originally-filed specification.

The rejection of claims 1 and 3-7 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,160,533 to Tamai et al. (hereinafter "Tamai") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 1, as amended herein, recites an LCD control unit for driving an LCD panel in an LCD device. The LCD control unit includes a signal controller for generating a voltage address signal and a polarity control signal, a voltage generator block for generating a plurality of (n) γ-voltage levels and a plurality of (m) Vcom-voltage levels, a voltage selecting block for selecting a specified number of the γ-voltage levels and one of the Vcom-voltage levels based on the polarity control signal to output the specified number of γ-correction voltages and a Vcom voltage, where output of the voltage selecting block is selected from the plurality of (n) γ-voltage levels and the plurality of (m) Vcom-voltage levels according to a value of the voltage address signal, an impedance converter, coupled to the output of the voltage selecting block to convert internal impedances of the γ-voltage levels and the Vcom-voltage levels and generate the

specified number of the γ-correction voltages and the Vcom voltage according to a value of the polarity signal, and an LCD driver for generating a set of display data signals based on a set of external data signals, where the LCD driver receives the specified number of the γ-correction voltages output from the voltage selecting block and includes a γ-correction section for correcting voltages of the display data signals based on the specified number of the γ-correction voltages. Claims 2-7 depend directly or indirectly on independent claim 1.

The Tamai reference discloses a method and apparatus for driving a display panel. The system includes a reference voltage having a voltage level that increases or decreases stepwise with time. Gradation display is conducted by applying the voltage level at certain times to electrodes of the display panel. Multi-level gradation display is conducted without increasing the number of terminals to which voltage is inputted or the number of switching elements for applying the voltage to the electrodes. (See col. 5, lines 24-41 and col. 6, line 59 to col. 7, line 12 of Tamai.)

Prior to discussing the present rejection, Applicant would like to correct a typographical error in Applicant's previous response that was pointed out in the Final Office Action. Applicant intended to say, on page 11 of the previous response, that there is no mention in Tamai of a voltage selecting block including an impedance converter that converts internal impedances of the γ-voltage levels and the Vcom-voltage levels and generates the specified number of γ-correction voltages and the Vcom voltage, as is claimed by Applicant. Applicant submits that this assertion is accurately conveyed in other statements throughout the previous response.

Turning to the present rejection, Applicant notes that Tamai does not show, teach, or suggest recited features of Applicant's claims, including the recited feature of an impedance converter that, among other things, generates a specified number of correction voltages and a Vcom voltage according to a value of a polarity signal. As shown in Fig. 4 and described in the present application, Applicant's impedance converter includes a number of switches that are responsive to a polarity signal (106) provided to the impedance converter. In contrast, the circuit 63 of Fig. 4 in Tamai (which the Office Action characterizes as an impedance converter as recited by Applicant) does not generate any output voltage according to a polarity signal as recited by Applicant. Instead, at best, the circuit 63 of Tamai generates an output signal based solely on the input signal thereto (i.e., the signals from the flip-flops FF1-FF8). The polarity signal of Tamai appears to be controlling switches AS11, AS12, and AS13, which are not part of the circuit 63 and, instead, appear to control the voltage across the resistors R1-R7, which are also not part of the circuit 63. Applicant submits that element 63 in Fig. 4 of Tamai is arguably a mere voltage selector and does not include an impedance converter. Thus, Applicants respectfully submit that Tamai does not show, teach, or suggest at least the features recited in Applicant's claims of an impedance converter that, among other things, generates a specified number of the γ-correction voltages and a Vcom voltage according to a value of a polarity signal.

Furthermore, Applicant submits that that the structure show in Fig. 4 of Tamai appears to more generally correspond to the LCD driver 40 shown in Fig. 5 of the present application. The impedance converter 30 shown in the present application is disposed at a stage preceding the LCD driver 40.

According to the present invention, γ-signal and Vcom signal can be adjusted easily by selecting the specified number of the γ-correction voltage and the Vcom-voltages. In contrast, Tamai teaches to divide the voltage level using the resistors between VCC and VAA, and the divided voltages are selected by the analog switches AS1-AS8. The driving voltage is generated based on the selected voltage. Tamai arguably does not teach how to select divided voltages between VCC and VAA, nor how to generate the driving voltage based on the voltage after impedance is converted.

Accordingly, in view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Tamai in view of U.S. Patent No. 5,910,796 to Gormish (hereinafter "Gormish") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of claim 1 are discussed above with respect to Tamai. Claim 2 depends thereon.

The Gormish reference discloses a method of performing gamma correction for a display device. The Office Action cites Gormish as disclosing software controlling and setting gamma correction signals.

Applicant respectfully submits that Gormish fails to overcome the above-noted deficiencies of Tamai with respect to Applicant's claimed invention. Gormish makes no reference to an impedance converter. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Further, Applicant has added new claims 12 and 13 and respectfully submits that these claims are patentable over the prior art of record.

According to the new claim 12, the voltage generator block (see, for purposes of example only, element 20 of the present specification) generates a plurality of (n) γ-voltage levels and a plurality of (m) Vcom-voltage levels based on the voltage address signal (see element 105) . The voltage selecting block selects one of the γ-correction voltages and one of the Vcom-voltages based on the address signal. The impedance converter (see element 30) then converts internal impedances of the γ-voltage levels and the Vcom-voltage levels to generate a specified number of γ-correction voltages and a Vcom-voltage based on the polarity control signal (see element 106). Claim 13 depends from independent claim 12.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
CHOATE, HALL & STEWART

Date: October 14, 2004

Donald W. Muirhead
Registration No. 33,978

Choate, Hall & Stewart
Exchange Place
53 State Street
Boston, MA 02109
Phone: (617) 248-5000
Fax: (617) 248-4000